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Award Abstract # 1644948
Collaborative Research: Numeracy Infusion for College Educators (NICE)

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ABSTRACT

Quantitative reasoning (QR), the contextualized use of numbers and data in a way that involves critical thinking skills, is essential for informed decision making, career advancement, and full participation in civic life. Most students do not have sufficient opportunities to learn the QR skills needed for personal and professional success, and this disadvantage is particularly acute among students from underrepresented minority populations. In response to this need, two Hispanic-Serving Institutions (HSIs), Hostos Community College and Lehman College will implement a professional development (PD) project, Numeracy Infusion for College Educators (NICE), for 24 faculty in those two institutions along with Bronx Community College faculty (also an HSI). The project will build on prior work in which faculty members learned how to infuse QR into courses ranging from biology, chemistry, and mathematics, to African and African-American studies, history, and political science.

Over the course of the project, faculty volunteers will participate either in an intensive 10-week summer program or in a 10-month program offered during the academic year. The NICE project will teach faculty how to (a) apply QR within the context of their subject areas, (b) articulate QR learning goals and objectives, (c) incorporate best practices for teaching QR, (d) adapt and implement strategies for infusing QR into course instruction, and (e) assess the effectiveness of QR initiatives. The same progressive teaching methods that have proven effective in undergraduate QR instruction will be used to teach faculty within the NICE program; specifically, faculty will engage in active and collaborative learning using real-world data. Toward establishing an adaptable model for faculty PD in QR that offers a comparison between an extended academic year experience and a more intense summer-only experience, the project team will focus on three key research questions: (1) How does the NICE program enhance the QR teaching abilities of faculty? (2) How does the NICE program impact faculty efforts to infuse QR into their course instruction?; and (3) How does faculty participation in NICE translate into real QR learning gains among CUNY students?

PROJECT OUTCOMES REPORT

Disclaimer

This Project Outcomes Report for the General Public is displayed verbatim as submitted by the Principal Investigator (PI) for this award. Any opinions, findings, and conclusions or recommendations expressed in this Report are those of the PI and do not necessarily reflect the views of the National Science Foundation; NSF has not approved or endorsed its content.

Numeracy Infusion for College Educators (NICE), a collaborative research project between City University of New York's Lehman College and Eugenio Maria de Hostos Community College, in collaboration with Bronx Community College, provided professional development to faculty from diverse disciplines at each of the Bronx Hispanic-Serving Institutions. The intensive, multi-modal course, adapted from NSF-funded Numeracy Infusion Course for Higher Educations (NICHE) DUE #1121844, utilized a Learning Management System (LMS) to house and modularize reading materials and videos, online discussions, and the course deliverables. Faculty participants received detailed feedback from the NICE Team including the PIs, external evaluator, and senior personnel, and structured peer feedback from other NICE participants.

The pedagogical goals of NICE included: instruction in best practices for quantitative reasoning (QR) instruction, the development of high quality instructional materials (including QR learning goals, QR assignments, and QR assessments), infusing QR into a wide range of disciplines, and increasing faculty comfort in teaching QR including strengthening faculty participants' QR skills (if necessary).

Twenty-eight faculty from participating institutions attended the kickoff workshops and 26 enrolled in two NICE cohorts, one summer intensive cohort and one academic year cohort, and engaged in a variety of best practices in QR instruction throughout the eight modules of the online course delivery. Twenty-one participants completed all or the majority of key deliverables and represented nearly as many distinct disciplines ranging from Allied Health to English to Office Technology to

Physics (to name just a few), surpassing our goal of 20 faculty participants and wide disciplinary focus.

NICE participants and several NICHE participants came together at Hostos Community College for our NICE Capstone Conference; they presented their instructional materials and assessment data, presented posters with assessment data, and listened to Lehman and Hostos students who took numeracy-infused courses. The in-person workshops that kicked off each cohort, the collaborative nature of the online course delivery, and the capstone conference helped us to achieve the goal of establishing a network of faculty across CUNY who infuse numeracy in their courses. The capstone conference and faculty reflections on their assessment results provided insight into learning gains among CUNY students with respect to QR/QL learning goals in numeracy-infused courses. The student demographics at each institution are predominantly underrepresented minorities in STEM and the majority of our faculty participants identified as female (21/26) and approximately half identify as racial/ ethnic minorities; therefore, NICE doubly benefits undergraduate education by providing professional development to diverse faculty who teach underrepresented students in both STEM and non-STEM courses.

The PIs and NICE faculty participants made over a dozen conference presentations. Some of the ripple effects of the NICE Program are yet to be fully realized, but one participating institution has added QR as an institutional learning outcome and linked it directly to the institutional mission. Future publications will disseminate research findings related to the effectiveness of delivery by comparing the summer cohort and academic year cohort and the collaboration between four- and two-year institutions, both of which will contribute to best practices for faculty development and collaboration.

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